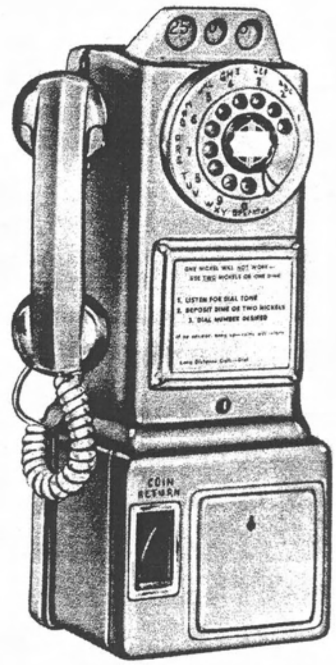
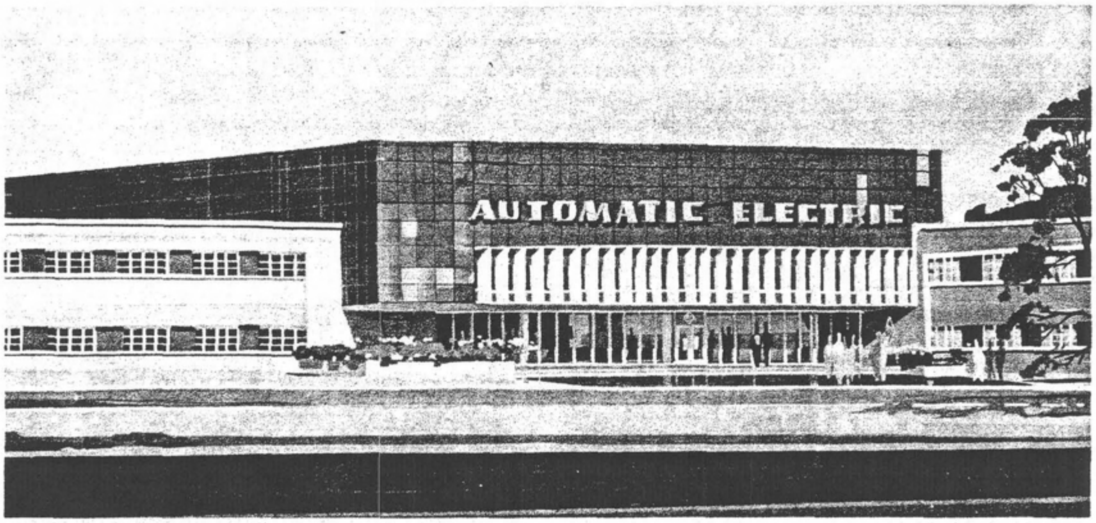
Local Prepay Paystation Series 89 470-920

LOCAL PREPAY PAYSTATION SERIES 89



Technical bulletin **470-920**

AUTOMATIC ELECTRIC
GENERAL SYSTEM
Subsidiary of
GENERAL TELEPHONE & ELECTRONICS



Factory, development laboratories, and general office at Northlake, Illinois, U.S.A.

AUTOMATIC ELECTRIC COMPANY is an organization of designing, engineering, and manufacturing specialists in the fields of communication, electrical control, and allied arts. For more than sixty years the company has been known throughout the world as the originator and parent manufacturer of the Strowger Automatic Telephone System. Today Strowger-type equipment serves over 75% of the world's automatic telephones. The same experience and technique that have grown out of the work of Automatic Electric engineers in the field of telephone communication are also being successfully applied on an ever-increasing scale to the solution of electrical control problems in business and industry.

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Strowger Automatic Telephone Systems—Complete automatic central-office equipment for exchange areas of any size, from small towns to the largest metropolitan networks.

Community Automatic Exchanges—Unattended automatic units for small rural or suburban areas, with facilities for switching into attended exchanges.

Automatic Toll Boards—An adaptation of Strowger principles to toll switching, resulting in simplification of operators' equipment and greater economy of operating and toll-circuit time.

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Exchange Accessory Equipment—Auxiliary exchange and substation equipment, including manual desks, testing apparatus, transmission equipment, and all accessories needed for the operation and maintenance of the modern telephone exchange.

Makers also of electrical control apparatus for industrial, engineering, and public utility companies, telephone apparatus for railroads and pipe-line companies, private telephone systems of all types, electrical and communication devices for aircraft and airways control, and special communication apparatus for military and naval departments.

LOCAL PREPAY PAYSTATION

SERIES 89

1. DESCRIPTION

1.1 The Types LPA 89, LPA 89-55, LPB 89, and LPB 89-55 Paystations (figure 1), described in this bulletin are designed for use in an automatic exchange equipped with line adapters, a -110-volt d-c source, and an interrupter which automatically refunds coins (on toll calls, a CLR trunk adapter is required). The reversal of 48-volt exchange battery collects the coins. The LPA series paystations use a manually-adjusted, loop-compensating network; the LPB series paystations use a self-compensating network. The -55 suffix, after the paystation type number, denotes 2-nickel service.

1.2 The calling party is connected to a local trunk at the central office upon lifting the handset off-hook. The calling party receives dial tone, but cannot dial until 2 nickels, 1 dime, or 1 quarter has been deposited.

(1) After deposit of the required coins, the calling party may dial. When the called party answers, the money deposited falls into the cash box. The paystation is automatically restored to normal by the central office upon completion of the call.

(2) If the call is not completed, the caller hangs up, the money deposited is returned, and the paystation is automatically returned to normal.

1.3 On incoming calls, the coin mechanism is always set to the collect position by reverse battery from connector talking bridge.

1.4 For toll calls, the calling party dials the toll operator code after the deposit of the required coins. As soon as a CLR trunk is seized, the original coin or coins are automatically returned. The coin mechanism, inside the paystation telephone, then reoperates (by reverse battery) to the collect position, under the control of the CLR trunk adapter. The operator establishes the connection with the distant station and then requests deposit of the required coins to cover the toll charge. The coins drop over the coin signal gongs into the coin receptacle and cannot be returned.

1.5 The physical construction of the local prepay paystation is similar to the standard prepay paystation as described in Technical Bulletin 918, with two exceptions: relay construction and the ringer box. Normally a ringer box, equipped with only the ringer mechanism, is used. With a series 89 paystation, a horizontal-type telephone relay with a two-winding coil and two sets of make (A-contact) contacts, a .4-microfarad capacitor (when used with LPB series), and a neon bulb, are mounted alongside of the ringer mechanism (see figure 2).

Figure 1. Local prepay paystation, type 89.

2. INSTALLATION

2.1 To install a paystation telephone, follow the steps below:

(1) Place the backboard (figure 3) against the wall vertically (it is important that the backboard and the paystation are perfectly upright).

(2) Mark through holes (B) onto the wall.

(3) Drill holes in the wall where marked to take anchors, either Ackerman-Johnson or Rawl-Taper, 1/4-20. Mount the anchors in the wall.

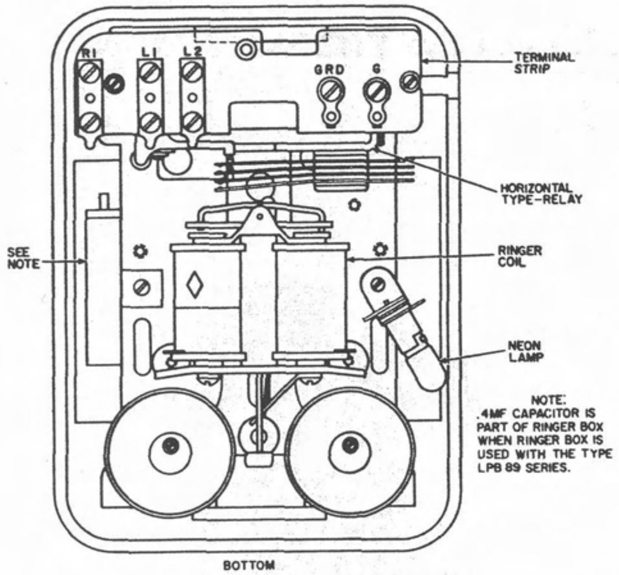


Figure 2. Ringer box.

(4) Push the end of the 3-conductor interior wire through the hole marked D (figure 3).

(5) Push one end of the paystation interior wire (4-conductor) through hole D.

(6) Carry the paystation interior wire up the channel at the rear of the backboard.

(7) Push the end of the paystation interior wire through hole C (figure 3).

(8) Mount the backboard using the anchor screws, unlock the upper housing of the paystation, and lift the housing off.

(9) Mount the lower housing and backplate onto the backboard with 1/4-20 flathead machine screws, using holes (A) which have threaded inserts to take the 1/4-20 screws.

(10) Make sure that the ends of the interior wire come through the slot in the backplate by the terminal strip without pinching.

(11) Remove the cover from the ringer box and mount the ringer box on the bottom part of the backboard, with wood screws.

(12) Make sure again that the interior wire has free access to the ringer box without being pinched.

(13) Connect the paystation interior wires (4-conductor cable) to the proper ringer box terminals and connect the line wires and ground to the ringer box terminals (figures 4 and 5, wiring diagrams).

(14) Replace the cover on ringer box and replace upper housing on paystation and lock.

3. TEST

3.1 After installation, check the paystation telephone in the following manner:

(1) Insert 2 nickels, dial the paystation number, and wait for busy tone. Hang up and check for money refund.

(2) Unlock cash compartment door.

(3) Insert a dime; dial central office.

(4) After the automatic return of the initial coin deposited and the relay reoperates (by reverse battery) to the collect position, check that the money when redeposited falls into cash box.

(5) Repeat the same procedure with a quarter, and advise the operator that you are testing coin signals.

(6) Have the operator identify all coins deposited.

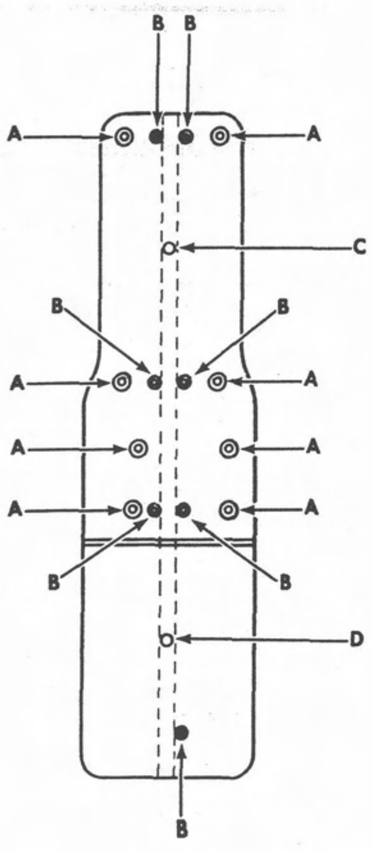
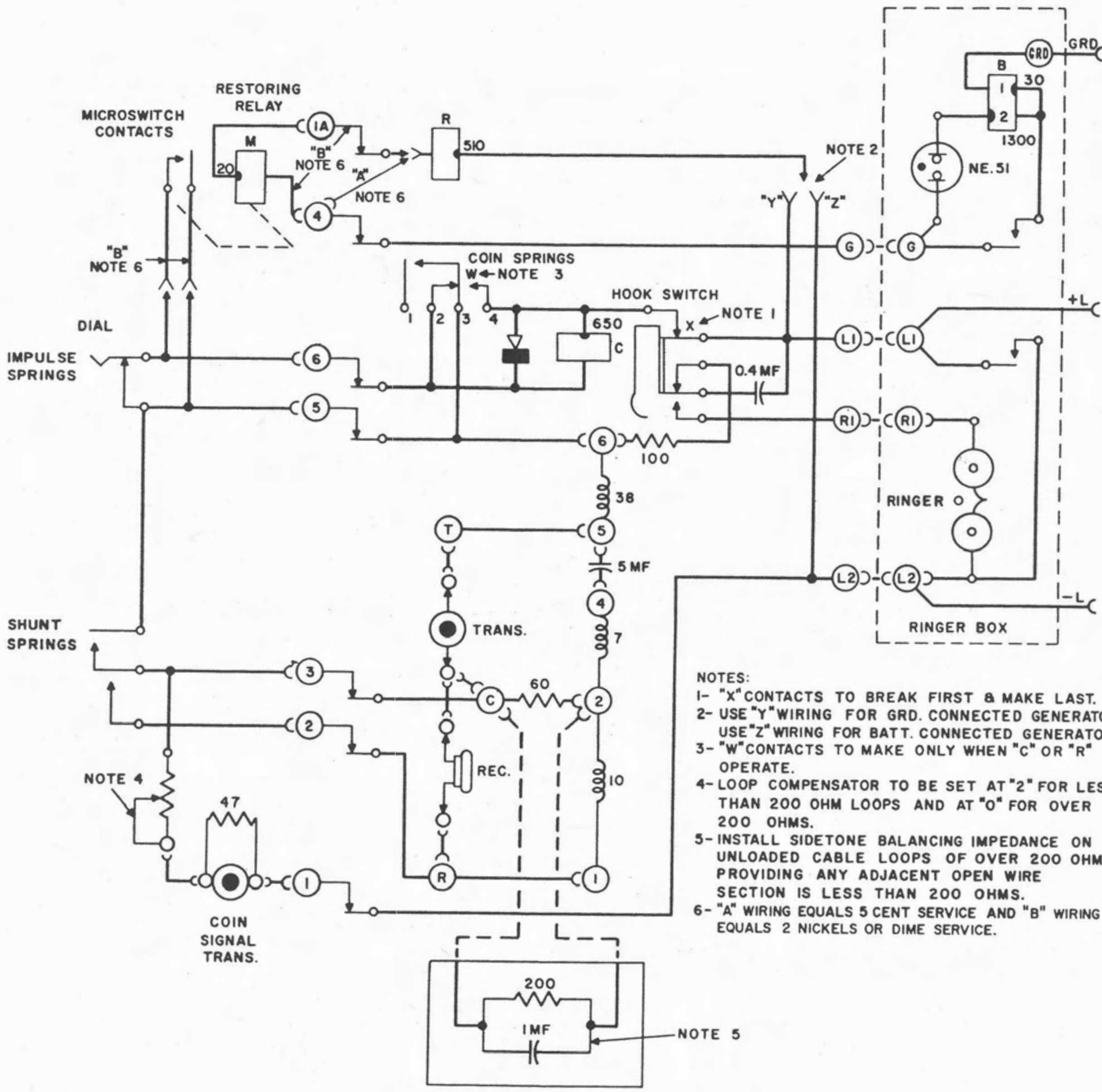


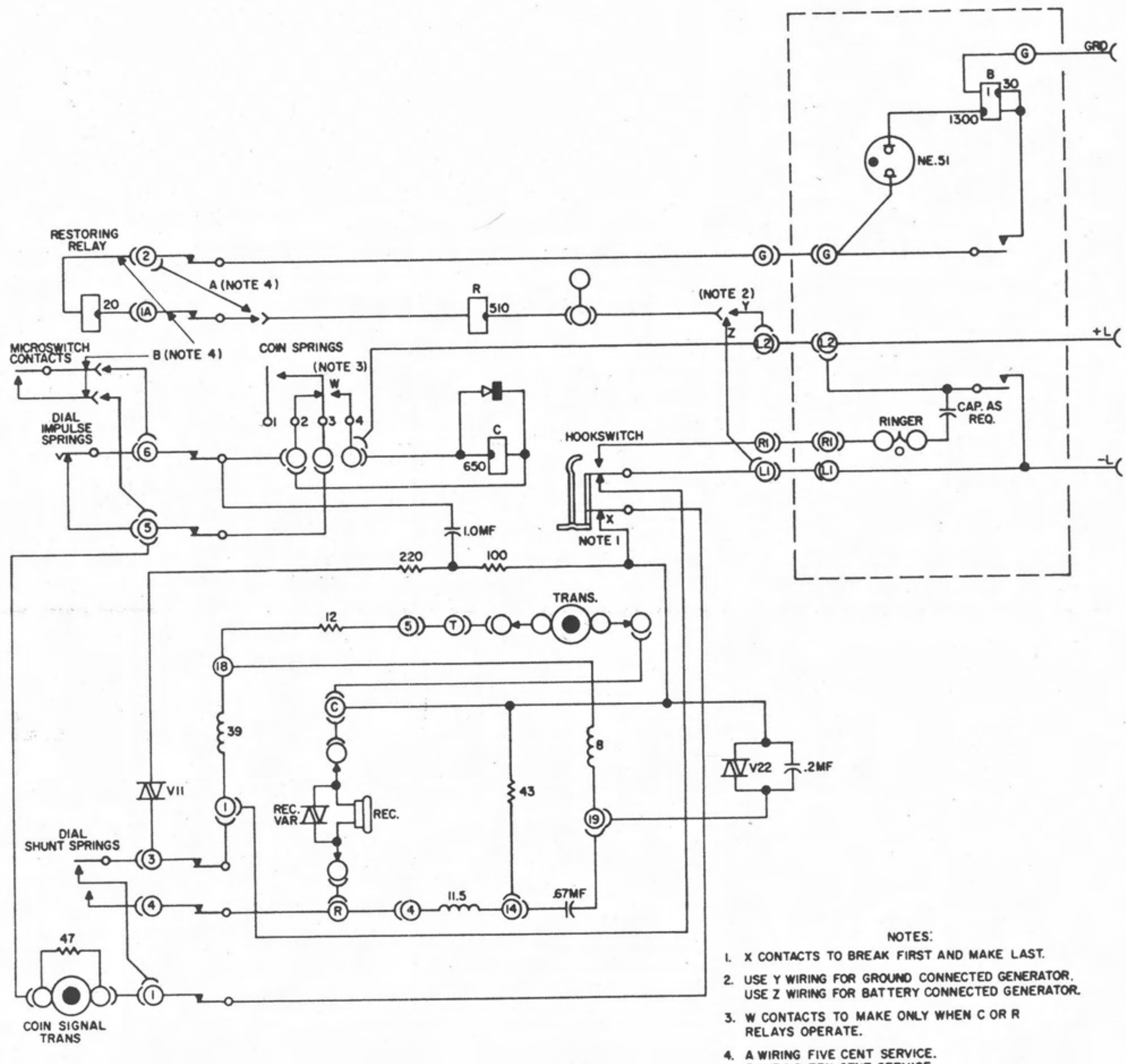
Figure 3. Backboard.



NOTES:

1- "X" CONTACTS TO BREAK FIRST & MAKE LAST.
2- USE "Y" WIRING FOR GRD. CONNECTED GENERATOR. USE "Z" WIRING FOR BATT. CONNECTED GENERATOR.
3- "W" CONTACTS TO MAKE ONLY WHEN "C" OR "R" OPERATE.
4- LOOP COMPENSATOR TO BE SET AT "2" FOR LESS THAN 200 OHM LOOPS AND AT "0" FOR OVER 200 OHMS.
5- INSTALL SIDETONE BALANCING IMPEDANCE ON UNLOADED CABLE LOOPS OF OVER 200 OHMS PROVIDING ANY ADJACENT OPEN WIRE SECTION IS LESS THAN 200 OHMS.
6- "A" WIRING EQUALS 5 CENT SERVICE AND "B" WIRING EQUALS 2 NICKELS OR DIME SERVICE.

Figure 4. Type LPA 89 paystation schematic.



NOTES:

1. X CONTACTS TO BREAK FIRST AND MAKE LAST.
2. USE Y WIRING FOR GROUND CONNECTED GENERATOR. USE Z WIRING FOR BATTERY CONNECTED GENERATOR.
3. W CONTACTS TO MAKE ONLY WHEN C OR R RELAYS OPERATE.
4. A WIRING FIVE CENT SERVICE. B WIRING TEN CENT SERVICE.

Figure 5. Type LPB 89 paystation schematic.

(7) Close cash box door.

4. MECHANISM

4.1 The coin gauge at the top of the upper housing consists of three different size openings: nickels, dimes, and quarters. Each opening is connected to a different channel in the coin chute.

4.2 The coin chute (figure 6) is mounted immediately below and in line with the coin gauge. The coin chute has 3 channels of varying sizes. The channel under the nickel gauge is larger than the dime channel and smaller than the quarter channel. Therefore, only the correct coin in its correct channel will operate the mechanism. All three channels end directly over the mouth of the coin hopper. The lugs which hold the coin chute to the upper housing are part of a framework welded to the upper housing, and this framework constitutes the coin-return chute for incorrect coins which when deposited fall out of the coin chute. The incorrect coins fall out because the depth of the particular channel on the rear face of the coin chute is just deep enough to hold a coin of the right size. After falling out of the coin chute, the coins hit the coin-return chute and are guided to the mouth of the coin-return chute in the lower housing. A permanent magnet, mounted in the quarter channel on the coin chute, acts as a slug rejector. A slug, possessing magnetic properties, is attracted by the slug rejector which prevents the slug from striking the cathedral gong. The slug is guided to the coin hopper, and later to the coin receptacle without being accepted in payment of a toll call.

4.3 The bell (coin signal), mounted on the left side of the coin chute (as seen from the rear in figure 6), is so situated with respect to the nickel and dime channels that the nickel will strike and ring the bell at the bottom of the bell, hence, there is only one ring. The dime on the other hand will strike the bell at the top and again at the bottom, making two rings. On the other side of the coin chute is the cathedral gong which a quarter hits once. The tones of the bell and the gong are easily distinguished by the operator at the central office. A transmitter, also shown in figure 6, conveys these signals to the operator.

4.4 Since this paystation is for ten-cent service, arrangements must be made so that 2 nickels or 1 dime is deposited before a local call can be made. This is done by the micro-switch shown in figure 7. The micro-switch is mounted on the coin chute with an extension of the wire operating arm in the nickel channel.

(1) The first nickel slides the operating arm down along the edge of the pendulum, pushing it somewhat below the pendulum notch. Gravity then draws the narrow bottom of the pendulum against the operating arm. When the first nickel passes beyond the arm, spring tension in the micro-switch lifts the arm into the notch where it latches as shown in the lower right-hand illustration of figure 7. The action of the operating arm short-circuits the dial pulse-springs.

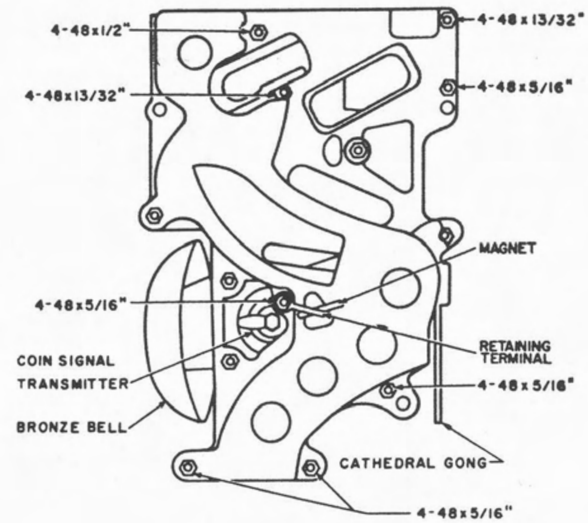


Figure 6. Coin chute.

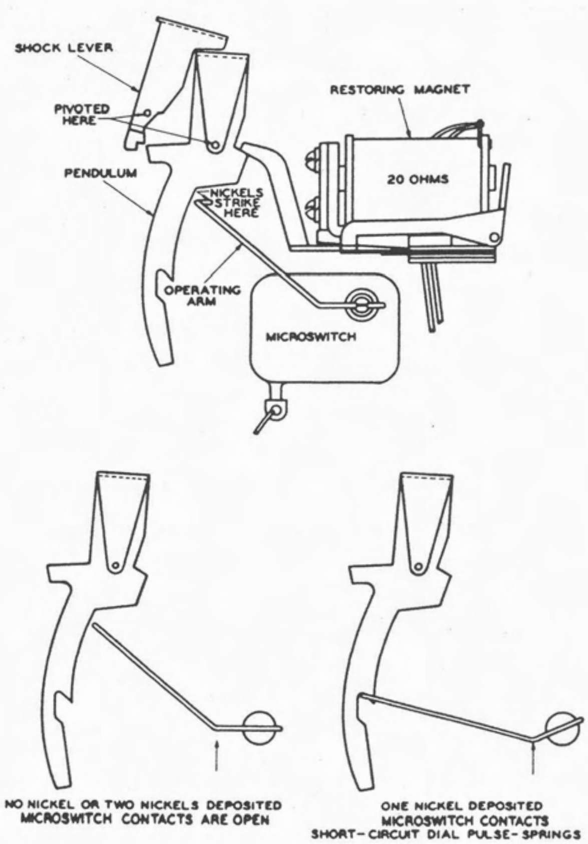


Figure 7. Two-nickel assembly.

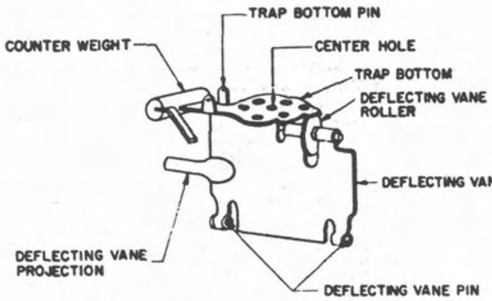


Figure 8. Trap and vane assembly.

(2) When the caller deposits the second nickel, it strikes the operating arm, pushing it downwards. The arm rides along the cam-like surface out of the notch, and throws the pendulum abruptly to the left. As the coin moves on, spring tension in the micro-switch raises the operating arm to normal. By the time the pendulum swings back against the operating arm, the arm is above the position where it could relatch. The micro-switch then restores, and removes the short circuit from the dial pulse-springs. The caller now can dial.

(3) If a dime (or a quarter) is used in the paystation, these operations do not occur; the pendulum and micro-switch function only when the nickel slot is used.

(4) Immediately above the micro-switch is the restoring magnet (figure 7). Since the restoring magnet is in series with the coin relay, the restoring magnet operates every time the central office sends coin-control current to collect or refund. In the event that either a single nickel (in the case of an abandoned call) or an odd number of nickels (in the case of a toll call) have been deposited, the operating arm of the energized restoring magnet moves the pendulum to the left and allows the operating arm of the micro-switch to restore and set the mechanism for the next call. If one nickel is inserted and the caller hangs up, the nickel is refunded. The shock lever is a protective device. If the paystation is given a blow after one nickel has been inserted, in an attempt to set the mechanism for a call with only one nickel, the shock lever moves over and stops the pendulum from moving and the micro-switch operating arm remains latched.

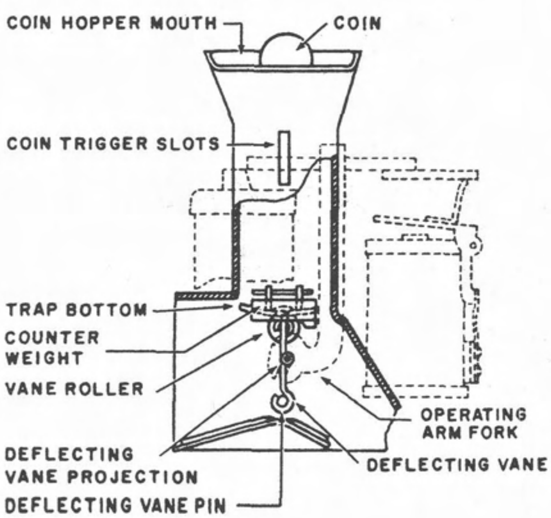


Figure 9. Trap and vane in normal position.

4.5 The coin hopper and its action are illustrated in figures 8, 9, 10, and 11. Figure 8 shows the internal mechanism of the coin hopper with the housing removed. As the coin leaves the coin chute, it enters the coin hopper mouth, falls, and trips the coin trigger, as shown in figures 12 and 13. The coin trigger opens one set of dial shunt springs to allow the calling party to dial after the deposit of a dime or quarter, and comes to rest on the trap bottom (figure 9).

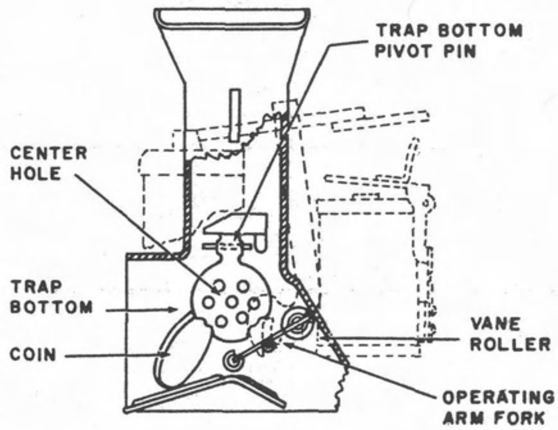


Figure 10. Trap and vane in refund position.

(1) The trap bottom is held up by the roller of the deflecting vane, and the coin remains on the trap bottom.

(2) The projection of the deflecting vane is engaged with the fork of the operating arm of the coin relay. When current from the central office operates the relay, the fork of the operating arm moves to the right or left depending upon the voltage and polarity of the current.

(3) The fork in moving to the left or right carries the projection of the deflecting vane with it, and since the projection is part of the deflecting vane, the vane must also move to the left or right. As the deflecting vane moves under the direction of

the fork, the roller moves from beneath the trap bottom. The weight of the coin overcomes the resistance of the counterweight, the trap bottom falls down, pivoting on its pin, and the coin slides off the trap bottom and is deflected by the deflecting vane to the left or right.

(4) On an unanswered call, after the calling party hangs up, -110 volts dc is placed on line -L to ground by the central office equipment, energizing the refund relay. The operating arm fork moves to the right and positions the deflecting vane to deflect the coins into the refund compartment (figure 10). In the case of a local call, when the called party answers, the battery from the central office equipment is reversed and operates the collect relay. The collect relay removes an armature stop bracket and allows the operating arm to move to the left which

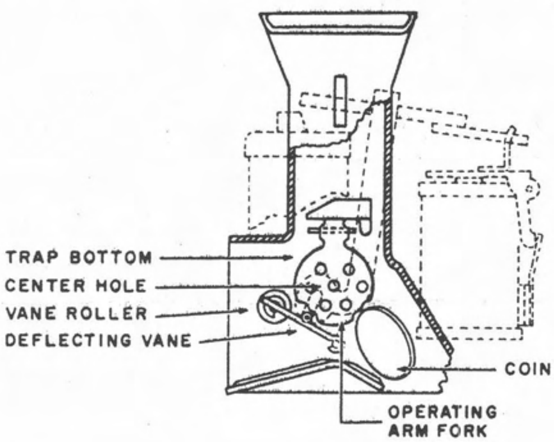


Figure 11. Trap and vane in collect position.

positions the deflecting vane to deflect the coin into the cash compartment (figure 11).

(5) After the coin has dropped, the counterweight of the trap bottom returns the trap bottom to the horizontal position, and upon placing the handset on-hook, a -110-volt pulse momentarily operates the refund relay. The refund relay moves the operating arm fork to the right, repositions the deflecting vane, and upon de-energizing, allows the vane to return to its normal vertical position, indicated in figure 9. When another coin is dropped for another call, the trap bottom will remain in position holding the coin until such time as the coin or coins are to be collected or refunded.

4.6 The coin relay assembly consists of the refund coil and a collect relay and latch assembly with a permanent magnet armature

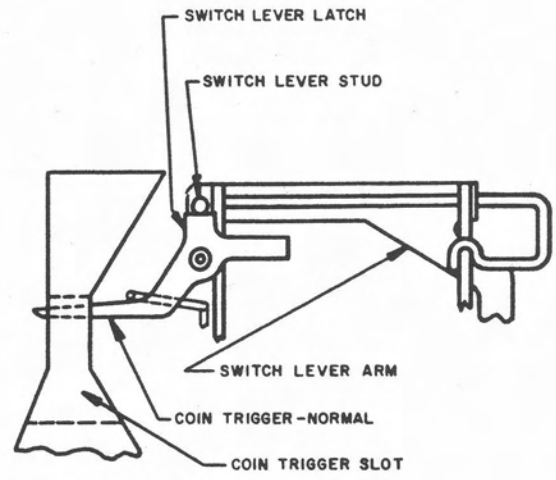


Figure 12. Coin trigger normal.

pivoted in the center above the coil and relay. In this way, the armature can be made to rock on its pivot to the right or left as required by either reversing battery to the paystation lines or applying a -110-volt potential between lead -L and ground. This action governs the collection or refund of coins.

(1) Figure 14 shows the various parts of the coin relay with the ground switch spring assembly excluded. Situated on the top of the armature is the operating arm assembly which is pivoted in the center. It consists of the fork which engages the projection of the deflecting vane (figures 9, 10, and 11), the horizontal portion which is in contact with the armature and the operating arm stud which operates the switch springs. Above the operating arm are spring-loaded levers pivoted on the same pivot as the operating arm. The left spring applies a light force to the left lever while the heavy right spring applies a larger force to the right lever. The right lever forces the armature to rock to the right and holds the armature in that position when the latch, mounted on the armature

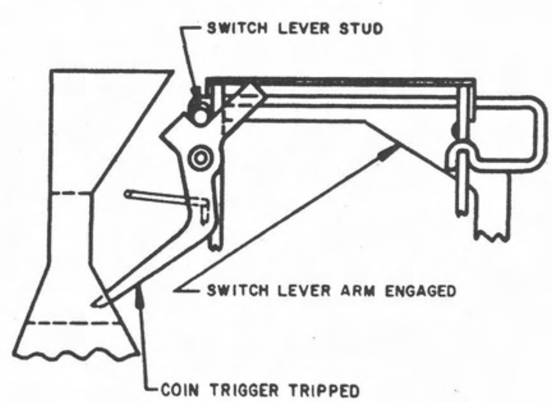


Figure 13. Coin trigger tripped.

of the collect relay, is removed upon battery reversal and forces armature to return to horizontal when -110 volts is removed from the refund relay. The left lever is used to limit the right lever action.

(2) Also mounted on the coin relay is the switch lever, which is pivoted on the coin relay frame. One end of the switch lever rests on the latch of the coin trigger, while the other end (shown in figures 15, 16, 17, and 18) has a half-round set in it which allows the stud of the operating arm to restore the switch lever when required. Also mounted on the coin relay frame is the coin trigger which is also pivoted (figures 12 and 13). The coin trigger is counterbalanced in such a way, that if free, it will return to the horizontal position of its own accord. The tip of the coin trigger protrudes through the slot in the front and rear of the coin hopper: therefore, it is impossible for a coin to drop through the coin hopper without tripping the trigger.

4.7 Figure 15 shows the relay and switch contacts after a coin has been deposited and is in the coin hopper. The trigger has been forced downwards and the latch has moved away from the switch lever, allowing the switch lever to drop slightly. With the switch lever in a lowered position, it prevents the coin trigger from returning to the horizontal position because the latch of the coin trigger is butting up against the switch lever. Refer to figure 15, and note the position of the stud, switch lever, and contacts. The end of the switch lever with the half-round set has been allowed to move slightly to the right and the switch spring contacts are now closed. The stud remains in the center. The dial can now send pulses unless the first coin dropped was a nickel; in this case, the micro-switch places

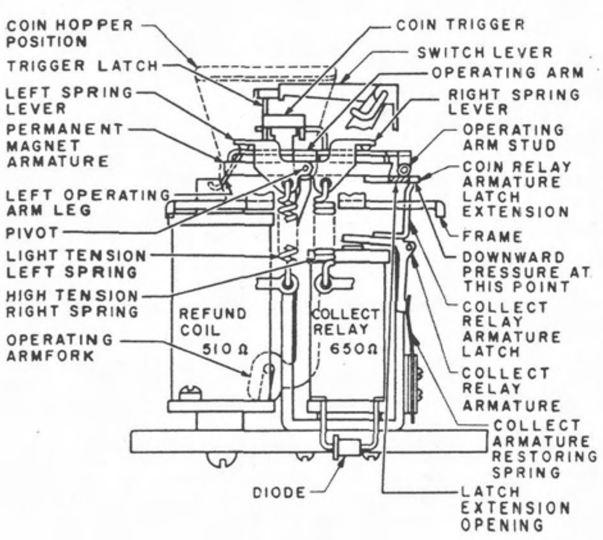


Figure 14. Coin relay partial assembly.

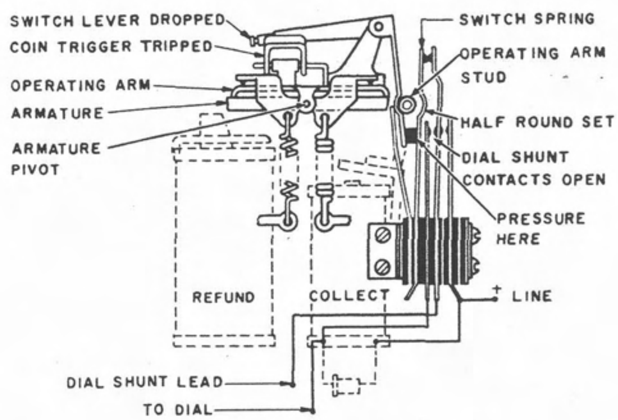


Figure 15. Coin relay with coin deposited.

a shunt across the dial to prevent pulses from being sent to the central office until the second nickel has been deposited. The second nickel removes the micro-switch shunt from the dial (section 4.4). In the case of a dime or a quarter, the trigger lever opens the path for dial pulses.

(1) In figure 16, the called party has answered which causes the central office equipment to reverse battery to the paystation line. With the battery polarity normal, the diode shown connected across the terminals of the collect relay, shunt the coil. When battery is reversed, the diode no longer conducts current and cannot shunt the collect relay. The collect relay operates and disconnects the collect relay armature latch from the coin relay armature latch extension which has held the armature in the normal horizontal position. The armature then rocks to the right under the mechanical force applied by the right spring lever, moving the operating arm fork and deflecting vane to the left as shown in figure 11. The coins are deposited.

(2) At the same time, the stud of the operating arm has been moved downward out of the area of the 2 half-round sets of the switch lever and the switch spring. The stud, in riding down, forces the switch lever to the left, and being at a right angle, the other end of the switch lever moves upwards and away from the latch of the coin trigger (figure 15). This allows the coin trigger to regain its horizontal position. Also, the movement of the stud out of the area of the 2 half-round sets ensures that the collect-coil contacts will remain closed throughout the operation due to pressure on both springs (these springs shunt the collect coil).

(3) The coin relay armature will remain in the collect position, mechanically

held by the spring tension applied to the right operating lever, until the calling party completes the call and replaces his handset.

(4) When the calling party replaces his handset, (figure 17) the central office equipment sends a -110-volt pulse over lead -L (applied between -L and ground) to the refund coil in series with the neon lamp and relay mounted in the ringer box. This voltage is high enough to fire the neon lamp whereas the regular exchange battery would not; current then passes through the circuit. The ringer box relay operates and shunts its operating path and the neon lamp to allow a high-current pulse to reach the refund coil. The refund coil is energized and rocks the armature to the left against the right spring tension, aided by the permanent magnet attached to the armature and the left spring lever. At the completion of the pulse, the right spring lever arm forces the armature to return to its normal position, resting against the collect relay armature latch (figure 18).

(5) When the called party does not answer and the calling party replaces his handset, a -110-volt pulse is applied by the paystation line equipment between lead -L and ground to the refund coil. The coin relay armature is in its normal position after coins have been deposited (figure 15). The refund coil is energized and rocks the armature to the left, against the right spring tension (figure 17). The armature, in rocking to the left, moves the operating arm fork to the right to refund the deposited coin. It may be noted that when the operating arm stud moves upward out of the 2 half-round position, it raises the switch lever arm and allows the coin trigger to restore and also holds the switch

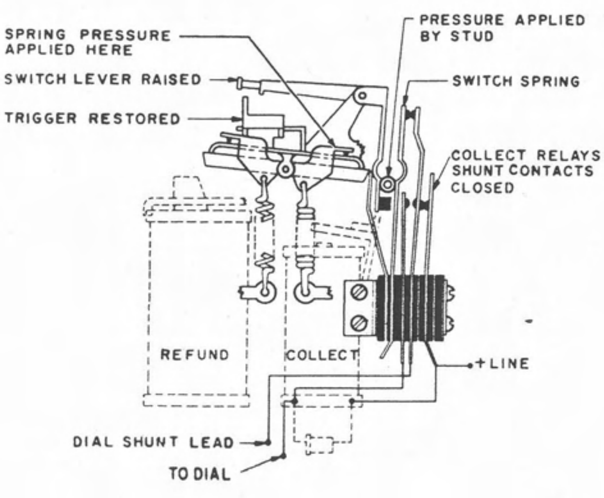


Figure 16. Coin relay in collect position.

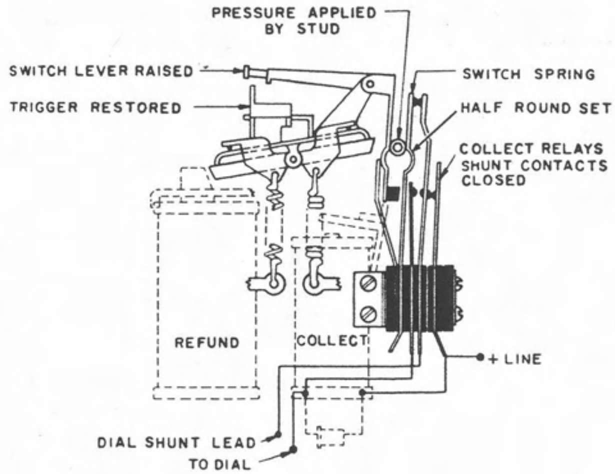


Figure 17. Coin relay in refund position.

springs operated for the collection of coins. At the end of the pulse, armature returns to its normal position under the force applied by the right lever arm to rest against the collect relay armature latch. The springs are then returned to normal, with the dial shunt spring contacts closed (figure 18).

5. ROUTINE MAINTENANCE OF UPPER HOUSING

5.1 When carrying out inspection of the coin gauge, check to be sure that it is clean, unmutilated, and does not contain any coins or slugs. Do not use hard steel instruments to remove coins or slugs; use a wooden instrument, such as a toothpick or orange stick. In the case of stuck coins, etc., find the cause of sticking; e.g., dirt, sticky deposits, or coin gauge out of alignment. If out of alignment or mutilated, replace the upper housing and overhaul the original upper housing in the shop.

5.2 On inspection of the coin chute, pay particular attention to cleanliness, and if a mutilated coin or slug has stuck in the chute, make certain the chute has not been damaged. If the chute is dirty or damaged, replace the upper housing and overhaul the original in the shop. Do not attempt to clean a dirty chute. Check the signals of a nickel, dime, and quarter. If the operator cannot recognize the signals, replace the upper housing and overhaul the original in the shop. With the upper housing off, check the micro-switch lever to insure that it latches in the notch when the first nickel is deposited and that it unlatches from the pendulum when the second nickel is deposited. Make sure that the shock lever engages with the pendulum when the upper housing is tilted 30 degrees to the left. Check that a penny or dime in the nickel chute falls into the return chute.

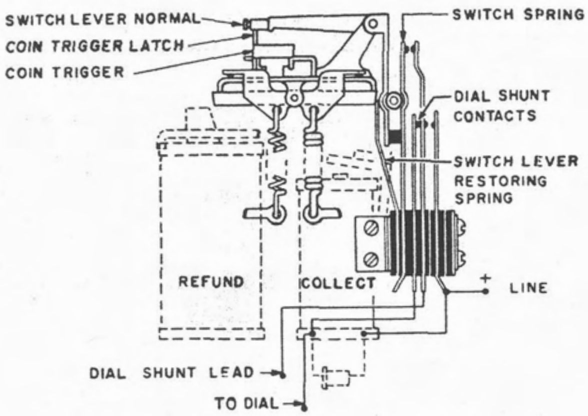


Figure 18. Coin relay in normal position.

6. ROUTINE MAINTENANCE OF LOWER HOUSING

6.1 When inspecting the lower housing, check the handset cord for continuity, and the hookswitch for ease of operation.

6.2 To remove the coin relays, unscrew the bolts at the heel plate of the coin relay and move the relay so that the operating arm fork is disengaged from the deflecting vane projection. With pencil point (or graphite), rub the inner surfaces of the fork. Check the coin trigger. Reinstall the coin relay and screw it down tightly (figure 19).

6.3 Check the trap bottom and deflecting vane for correct operation.

(1) Insert a thin piece of wood (3/4'' wide, 5'' long, and 1/2'' thick) into the mouth of the coin hopper, carefully push down the coin trigger, and continue until the wood touches the trap bottom.

(2) Depress the refund relay armature with the other hand.

(3) Push wood down along the trap bottom.

(4) Release the armature.

(5) Pull the wood strip slowly upward.

(6) Make sure the vane and trap bottom return to their original position.

(7) Repeat (1) to (6) but this time press the collect relay armature.

6.4 If the mechanism appears to be faulty, follow the steps below:

(1) Check the vane for tight bearings.

(2) Unscrew the coin control relay heel plate, disconnect the leads on the contact springs, and remove the coin relay, being careful to clear the trigger from the slot in the hopper.

(3) Take the vane projection and hold it almost vertically and a little to the left.

(4) Release the vane; it should drop fully to collect position.

(5) Repeat step (3), but to the right this time.

(6) If the vane binds, replace it.

6.5 Check the vane for binding on the hopper, in the following manner:

(1) Grasp the vane projection pin and pull it towards you.

(2) Move the vane to the left and to the right, while still pulling towards you.

(3) Make sure the vane does not scrape on the front of the hopper.

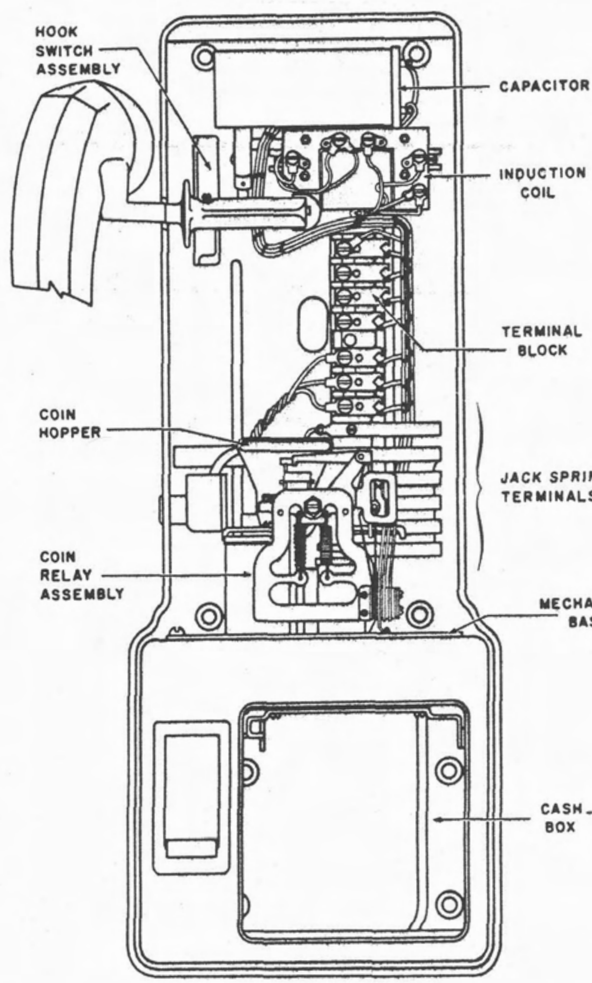


Figure 19. Lower housing.

(4) Repeat steps (1) to (3), but this time push the vane projection away.

(5) Make sure the vane does not scrape on the rear of the hopper.

(6) If the vane scrapes, replace the hopper assembly.

6.6 Check the ease of movement of the trap and vane.

(1) Move the vane to the left and lift the trap bottom counterweight with the other hand.

(2) Move the vane to an upright position slowly and keep a very light pressure on the counterweight.

(3) Make sure the vane lifts the trap smoothly and evenly.

(4) Move the vane to the right; repeat steps (1) through (3). If movement catches, replace the trap and vane.

6.7 Check the clearance between the trap and vane. Move the counterweight up and down; there should be a small clearance.

6.8 To install the coin relay after tests to hopper, follow the steps below:

(1) Ease the coin trigger through the slots in the hopper.

(2) Move the vane to an upright position and ease it into the fork.

(3) Move the relay to the right or left until the edge of the vane can be seen through the center hole of the trap bottom looking down the mouth of the hopper. Check also that the coin trigger is in the center of the slots and not scraping the sides.

(4) Screw down the heel plate, holding the relay to make sure that the relay does not move and upset the adjustment.

6.9 Check the coin shield, on the refund side of the hopper, to see that it opens freely. Replace the coin shield if it is faulty.

6.10 Check all switch points for cleanliness, especially the horizontal transfer switch points.

6.11 Check the dial for bind-free operation and correct speed.

6.12 Jumper terminals between the upper and lower housings using P-60605 Test Cord (figure 20), and call the station to note the operation of the collect and refund magnets and the restoring relay.

7. SHOP OVERHAUL INSTRUCTIONS

7.1 Unlock the upper housing with the key provided, pull the lower part of the upper housing towards you and lift, which disengages the projection on the inside top of the upper housing from the socket on the back plate. The upper housing will be clear.

7.2 The coin gauge (upper housing, figure 21) is mounted with rivets; to disassemble, remove these rivets, after first removing coin chute (see section 7.3). Install the coin gauge before installing the coin chute.

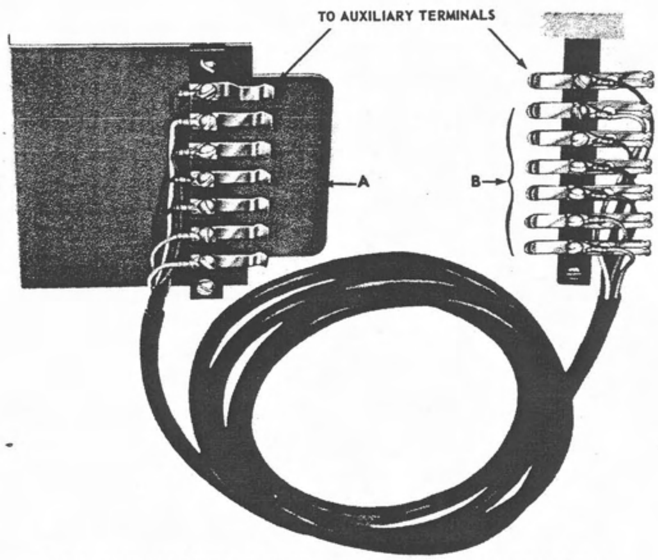
7.3 To remove and disassemble the coin chute (figure 22) follow the steps below:

(1) Lay the upper housing front downward on the bench. Remove the coin chute by unscrewing the 3 mounting screws.

(2) Unscrew all leads to the jackstrip terminal (see figures 23 and 24). Lift out the complete coin chute assembly carefully, making sure not to damage the cathedral gong.

(3) Pull the leads through the retaining bracket fixed to the housing.

(4) Lay the coin chute assembly flat with the subassemblies uppermost. Remove the screw holding the bronze bell and remove the bell, complete with brass washer.



A. SLIP THIS EDGE OF BRACKET UNDER JACK TERMINAL STRIP ON UPPER HOUSING
B. CLIP THESE TERMINALS TO JACK SPRINGS ON LOWER HOUSING

Figure 20. Paystation test cord.

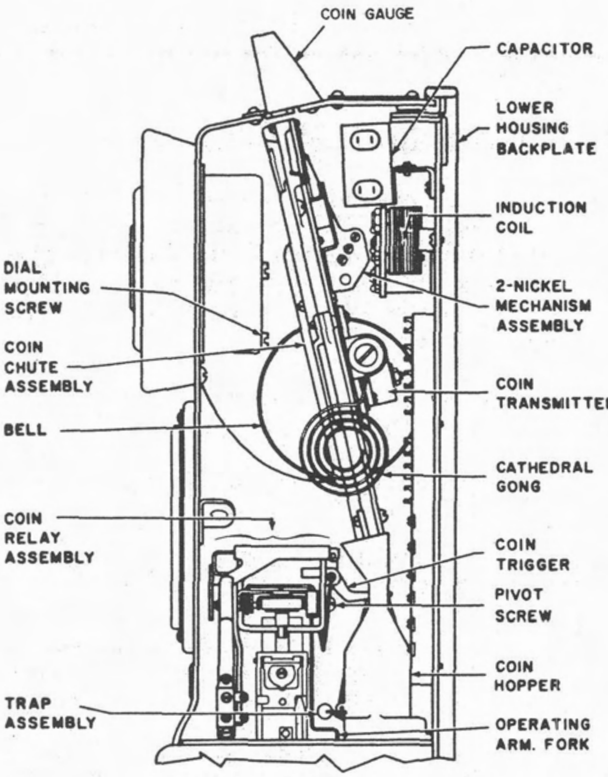


Figure 21. Upper housing in position.

(5) Unscrew the nut holding the cathedral gong and carefully remove the cathedral gong.

(6) Remove the mounting screws and nuts of the 2-nickel mechanism. Note that the long screw is situated underneath the restoring magnet.

(7) Remove the 3 screws and nuts holding the bracket on which is mounted the signal transmitter. Note that in this case, the long screw is situated just above the cathedral gong mounting. Lift off the bracket complete with the signal transmitter subassembly.

(8) Remove the 4 screws holding the signal transmitter assembly to the bracket. Lift off the assembly.

(9) Unscrew the nut holding the signal transmitter. Lift out signal transmitter.

(10) Remove the remaining 8 screws and nuts on the coin chute (see figure 6); remove the slug rejector magnet and retaining terminal, then the three parts may be separated.

(11) Remove the 2 screws holding the restoring magnet to the bracket and withdraw the restoring magnet.

(12) Remove the 2 screws running through the micro-switch and withdraw the micro-switch. Be careful not to damage spring arm.

(13) Remove the 2 remaining screws holding the cover plate of the pendulum and shock lever, and remove cover plate.

(14) Carefully, remove the pendulum and shock lever from their respective pivots. Draw the pivots from the back of the plate.

(15) Clean and inspect all parts thoroughly.

(16) Pay particular attention to the cleanliness and tension of the transfer springs mounted on the terminal block assembly on the back plate. These springs connect all the circuits through the jack springs from the upper housing.

(17) Replace parts as necessary.

7.4 To remove the dial, follow the steps below:

(1) Remove coin chute (see section 7.3).

(2) Disconnect the dial leads from the jackstrip terminal inside the upper housing. Remove the 3 small flat-head screws and pull the dial forward, carefully feeding the dial leads through the slot in the inner mounting cup.

7.5 To install the dial, follow the steps below:

(1) Feed the dial leads from the front of paystation through the slot in the inner mounting cup and push the dial home. Install the 3 flat-head long screws and tighten.

(2) Connect the dial leads to the jackstrip terminal as in the applicable wiring diagram (figure 23 or 24).

8. TESTS AND ADJUSTMENTS TO UPPER HOUSING

8.1 Test slugs, for the coin gauge and the coin chute, must have the dimensions listed below. Brass test slugs are suggested for the quarter channel.

(1) The coin gauge must accept the following maximum-size slugs:

	Quarter	Dime	Nickel
Diameter	0.961"	0.710"	0.846"
Thickness	0.083"	0.058"	0.083"

(2) The coin chute must accept the following maximum, minimum, and standard-size slugs:

Quarter			
	Max.	Min.	Std.
Diameter	0.977"	0.938"	0.961"
Thickness	0.090"	0.052"	0.083"
Dime			
	Max.	Min.	Std.
Diameter	0.721"	0.685"	0.710"
Thickness	0.070"	0.043"	0.058"
Nickel			
	Max.	Min.	Std.
Diameter	0.857"	0.805"	0.846"
Thickness	0.090"	0.050"	0.083"

(3) The maximum-size slugs will not pass through coin gauge. Coin chute must reject following minimum-size slugs:

	Quarter	Dime	Nickel
Diameter	0.903"	0.653"	0.767"
Thickness	0.083"	0.052"	0.083"

8.2 A coin (includes pennies), deposited in any opening, other than the one for which it is intended, must be conveyed to the coin return chute.

9. TWO-NICKEL MECHANISM

9.1 Check the pendulum and shock lever for free movement on their pivots. They must not bind in any way, or interfere with each other.

9.2 Operate restoring magnet relay with 1765 ohms in series on 50 volts (28 ma) and check that there is clearance between the micro-switch spring and that portion of pendulum just above the notch.

9.3 Check the operating arm of the micro-switch as follows:

(1) The hub must not interfere with the micro-switch mounting bracket.

(2) The operating arm must have approximately a 10° angle.

(3) The end of the operating arm in the coin chute slot must not rub against the sides and/or the back of the coin chute.

(4) The operating arm, when latched in the pendulum, must ride in the radius of the notch.

(5) With the operating arm engaged in the pendulum and the upper housing tilted clockwise approximately 30°, check that the shock lever slides off the left arm of the pendulum with perceptible clearance. This ensures that after the deposit of one nickel the pendulum will not disengage from the micro-switch operating arm.

10. RESTORING MAGNET RELAY

10.1 With the micro-switch in the latched position, the magnet relay shall operate and unlatch the micro-switch with a current of .0490 amperes (1000 ohms at 50 volts dc) but shall not unlatch the micro-switch with a current of .0395 amperes (1250 ohms at 50 volts dc).

11. UPPER HOUSING MECHANISM

11.1 To reassemble the upper housing mechanism, follow the steps below:

(1) Place the 3 parts of the coin chute together. Insert the slug rejector magnet in the slot at the quarter channel; position the retaining terminal, and install the screws and nuts (see figures 6 and 22). Take care to use the correct length screws. Tighten the screws.

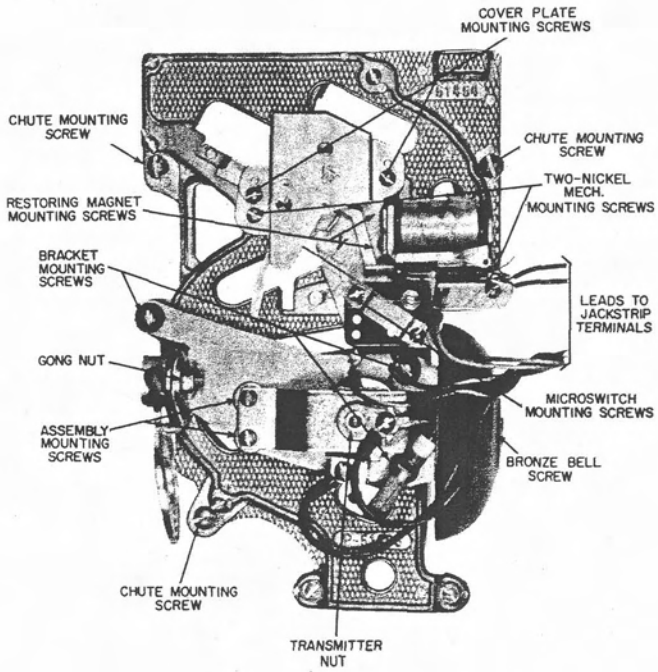
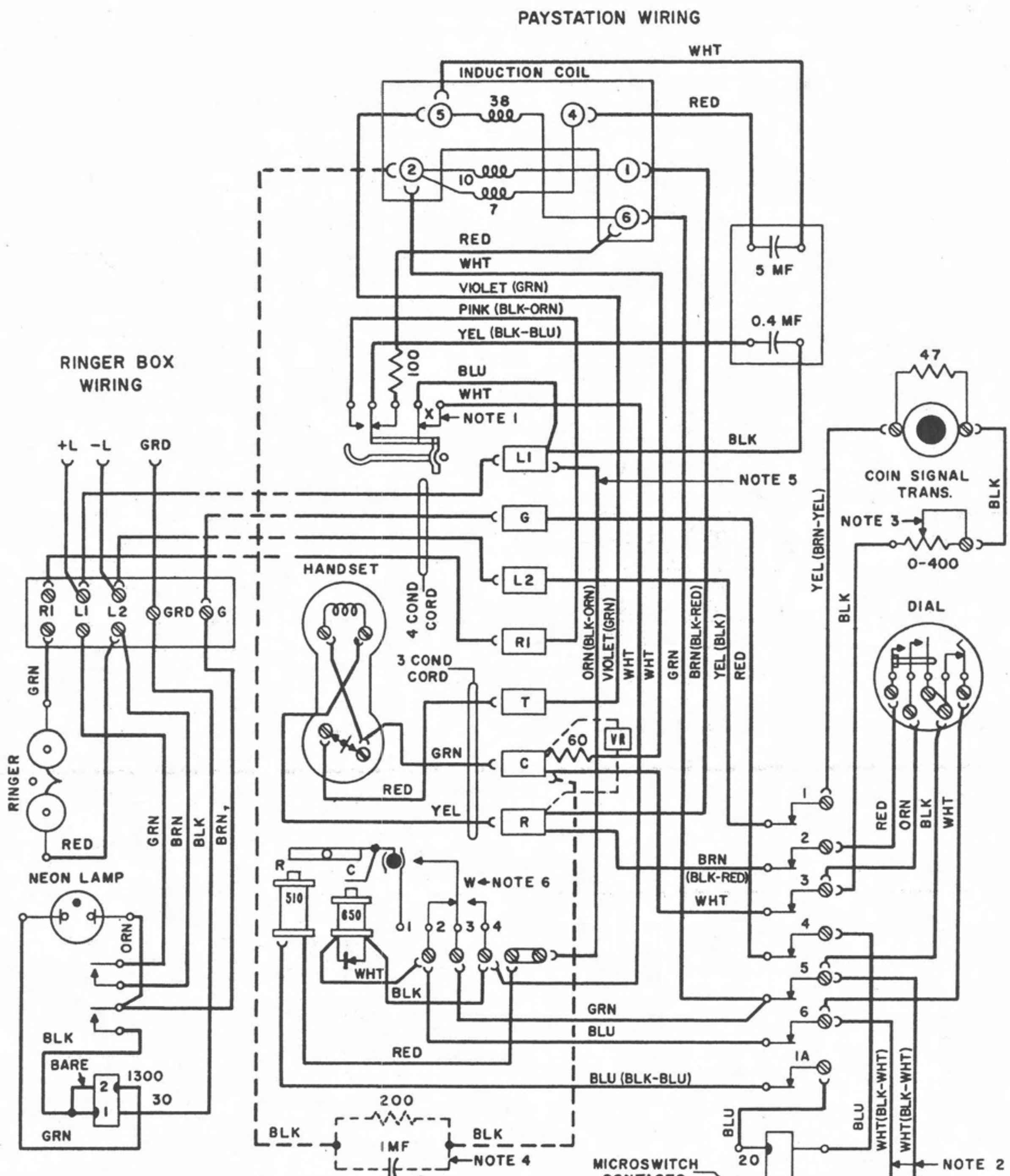


Figure 22. Coin chute assembly.



NOTES:

1- CONTACT "X" TO BREAK FIRST AND MAKE LAST.
2- FOR NICKLE SERVICE DISCONNECT LEADS INDICATED.
3- LOOP COMPENSATOR TO BE SET AT "2" FOR LESS THAN 200 OHM LOOPS AND AT "0" FOR OVER 200 OHMS.
4- INSTALL SIDETONE BALANCING IMPEDANCE ON UNLOADED CABLE LOOPS OF OVER 200 OHMS PROVIDING ANY ADJACENT OPEN WIRE SECTION IS LESS THAN 200 OHMS.
5- LEAD CONNECTED AS SHOWN IS FOR GRD. CONNECTED GEN. FOR BATTERY CONNECTED GEN. CONNECT THIS LEAD TO "L2" TERMINAL.
6- "W" CONTACTS TO MAKE ONLY WHEN "C" OR "R" OPERATE.
7- COLOR CODES THAT VARY FROM LPA 89 PAYSTATIONS AND APPEAR ON OLD TYPE 89 PAYSTATIONS ARE GIVEN IN PARENS.

Figure 23. Type LPA 89-55 wiring diagram.

(2) Install the bell and gong mounting bracket with the 3 screws and nuts, being careful to use the correct length screw. Tighten the screws and nuts.

(3) Mount cathedral gong and tighten the screw and nut.

(4) Mount the bronze bell, and be careful to mount the flat, brass washer in between the bell and the bracket with the countersunk part of the washer next to the bell. Tighten the screw.

(5) Test the coin chute with slugs (see section 8).

(6) Mount the restoring magnet to the mounting plate, tighten the 2 screws.

(7) Mount the micro-switch on the mounting plate, being careful to clamp the restoring magnet leads with the clamp bracket.

(8) Remount the copper pivots for the pendulum and shock lever. Carefully mount the pendulum on its pivot and the shock lever on its pivot.

(9) Place the pendulum and shock lever cover plate on the two pivots, being careful not to bend the pivots. Install the 2 small screws and tighten. Do not install the screws until the 2 pivots are through the 2 holes of the cover plate and the cover plate is fully home and completely touching the mounting plate.

(10) Mount the 2-nickel mechanism on the coin chute with the correct length screws and nuts, being careful not to damage the micro-switch operating arm. Tighten the screws and nuts.

(11) Test the coin gauge with slugs.

(12) Replace the coin gauge, if necessary, by knocking out rivets. Install a new coin gauge with rivets.

(13) Mount the coin chute and tighten the 3 mounting screws.

(14) Connect the leads per the applicable wiring diagram.

12. COIN CONTROL MECHANISM REMOVAL

12.1 To remove the coin control mechanism, follow the steps below:

(1) Loosen the 2 terminal screws at the spring contacts and 1 screw at rear of the coil.

(2) Disconnect the 3 leads and remove the 2 large round-head screws which hold the heel plate of the coin relay.

(3) Trip the coin trigger by hand.

(4) Carefully lift off the coin relay. Make sure that the fork disengages from the projection of the deflecting vane and that the trigger is not bent in the slots of the coin hopper.

12.2 To remove the coin hopper, first remove the 3 small screws from inside the top of the cash box and lift the coin hopper out.

12.3 Clean the coin hopper thoroughly with a soft brush. Remove any iron filings around the armature and coin relay coil cores. Make sure that the coin hopper mechanism works freely.

13. UPPER HOUSING LOCK

13.1 Check the lock and make certain that it operates under a force not to exceed 1000 grams at a point of leverage of 2'' from the center of the key.

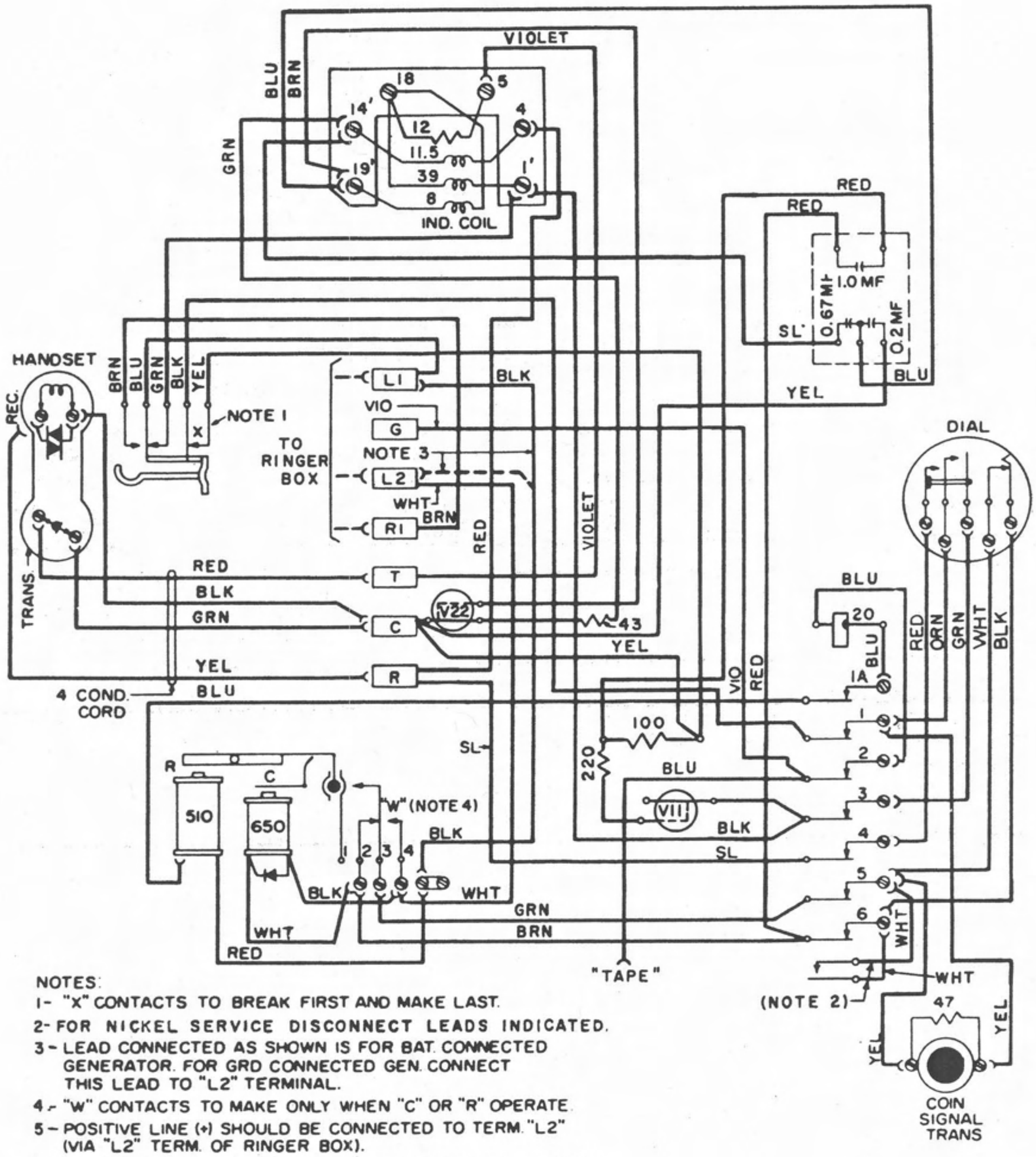
13.2 Test the insulation between all adjacent metal parts of the horizontal transfer switch. The insulation must withstand 500 volts ac with a frequency between 16 cps and 60 cps for one quarter of a second.

13.3 Test the pressure of the hookswitch contact points with the receiver off the hook. Pressure must not be less than 2-1/2 oz. Test the clearance between contacts when open, this must not be less than 1/64''. Test the hook with an 11-1/2 oz. receiver, the hook must go up to a full stop when the receiver is taken off.

14. LOWER HALF – ADJUSTMENTS

14.1 *Mechanism unit.* Before testing, set the line-compensating rheostat (on LPA 89 series) to zero (0) position. All tests involving the relays shall be made with the upper housing in place and a ringer box, No. L-1506-BSL (or No. L-1506-CSL on LPB series) connected to the paystation, except where direct connection to relay terminals is necessary.

(1) The collect magnet, with diode connected across the terminals, shall safely deposit a charge of one dime to eleven nickels when 15 volts dc is impressed across terminals L1 and L2. The positive lead from the test voltage must be applied to terminals L2 for LPA 89 series (L1 on LPB 89 series) off-hook. The collect magnet shall not operate on 13 volts under these same conditions. Also, the collect magnet shall not operate



NOTES:

1- "X" CONTACTS TO BREAK FIRST AND MAKE LAST.

2- FOR NICKEL SERVICE DISCONNECT LEADS INDICATED.

3- LEAD CONNECTED AS SHOWN IS FOR BAT. CONNECTED GENERATOR. FOR GRD CONNECTED GEN. CONNECT THIS LEAD TO "L2" TERMINAL.

4- "W" CONTACTS TO MAKE ONLY WHEN "C" OR "R" OPERATE.

5- POSITIVE LINE (+) SHOULD BE CONNECTED TO TERM. "L2" (VIA "L2" TERM. OF RINGER BOX).

6- TERM. "G" OF PAYSTATION IS ISOLATED FROM GROUND (GRD) BY A NEON TUBE AND A RELAY COIL MOUNTED IN THE ASSOCIATED RINGER BOX. (I.E. CONNECT "G" TERM. OF PAYSTATION TO "G" TERM. OF RINGER BOX - NOT TO "GRD" OF RINGER BOX). FOR RINGER BOX WIRING SEE FIGURE 5.

Figure 24. Type LPB 89-55 wiring diagram.

when 11 volts is applied directly to the collect magnet terminals (positive on white wire) but shall operate when 12.5 volts is applied. This adjustment is determined by proper spring tension of the collect magnet armature restoring spring.

(2) With the mechanism in normal position, the refund magnet shall operate when 85 volts dc is impressed across terminals L1 and GRD for LPA series (L2 and GRD for LPB 89 series). Repeat this test with the mechanism latched in the collect position.

(3) The armature shall not operate when 70 volts dc is impressed in either direction across terminals L1 and GRD for LPA 89 series (L2 and GRD for LPB 89 series), and eleven nickels are dropped into the coin hopper through the coin chute while current is passing through the coil. Repeat this test with the positive terminal of the test voltage applied to terminal L1 for LPA 89 series (L2 for LPB 89 series), and 36 volts impressed across terminals L1 and L2. The handset must be off-hook and the previous test voltage removed.

(4) There shall be 70 to 75 grams tension on the left spring lever. The tension is measured just as the lever breaks away from the operating arm. There shall be 175 grams tension on the right spring lever, also measured just as the lever breaks away from the operating arm. When measured at the operating arm stud, there shall be a minimum of 75 grams just as the leg of the operating arm breaks away from the frame.

(5) The coin relay armature shall be adjusted so that there is a .008'' to .010'' clearance between the armature and the refund coil polepiece.

(6) The coin switch springs shall be normally open not less than .010'' at contact points, and the minimum-size dime dropped through the coin chute into the coin hopper shall trip the coin trigger and cause the dial shunt springs to open not less than .010'' at the contact points, for each of the first ten times dropped. The collect magnet shorting springs (3 and 4) shall not make contact when the coin trigger is tripped. These springs shall make contact only when the mechanism is in the collect or refund position. The contact springs shall have a minimum follow of .010''. The switch lever may be bent to aid in meeting the above requirements.

(7) The coin trigger shall release the switch lever before the coin-engaging end of the coin trigger drops down to a point where there is 0.30'' clearance between the end of the coin trigger and the inside surface of the coin hopper. When the switch lever is tripped, the contact shall be held without a break until the armature is operated in either direction. The arm of the switch lever shall rest on the coin trigger approximately on the vertical line of the pivot for the trigger. After assembly, the extension of the coin trigger shall be located approximately on the vertical center line of the coin hopper slot and shall not touch either the side or the top of the slot.

(8) The coin trigger shall be adjusted so that the side play between the trigger and its supporting bracket shall not exceed .005''. The restoring arm, which extends from the operating arm, shall be adjusted so that the switch lever may be safely restored to normal position with full stroke of the armature, and to permit the coin trigger to latch the lever.

(9) The deflecting vane lever which extends down from the operating arm, in the normal position, shall bring the vane in a perpendicular line so that the thickness of the vane may be seen through the center hole of the trap bottom.

(10) The operating arm (the section connecting to the fork) shall be adjusted so that there is clearance between it and the spool head of the collect magnet when the armature is operated fully in the refund position.

(11) The mechanism shall be adjusted so that, with the armature in the normal position, the space between the frame and the lugs (which limit the armature travel) shall be within a minimum of .129'' and a maximum of .135''. There shall be a .020'' clearance between the operating arm and coin relay armature.

(12) The switch lever shall be adjusted so that the coin trigger, after being tripped, will safely restore when either of the operating arm lugs (which limit the armature movement) is given its full travel; but shall not restore when either of the operating lugs is moved downward slowly by hand to within .030'' of its full downward travel. For the refund position, this is done by applying pressure inside the rounding at the end of the operating arm lug. For collect position, the collect magnet armature is operated by hand and the armature retarded at the latch.

(13) The clearance between the latching arm extension on the collect coil armature and the inside of the latch arm extension on the mechanism armature shall be a minimum of .018'' and a maximum of .022'' when the mechanism is operated to the collect position by hand and retarded from its travel. The stroke of the collect magnet armature shall be approximately .040''. The latching arm extension should rest flat on the top of the latch.

14.2 Relay operation and adjustment. The collect magnet shall operate on 15 volts across terminals L1 and L2 (positive to L2 on LPA 89 series, positive to L1 on LPB 89 series), and the refund magnet shall operate with between 85 and 120 volts across terminals L1 and GRD on LPA 89 series and L2 and GRD on LPB 89 series, both tests with a pileup of eleven nickels or one dime. The collect magnet shall not operate under any condition with 13 volts across the terminals L1 and L2 (positive to L2 on LPA 89 series and positive to L1 on LPB 89 series), and the refund magnet shall not operate under any condition with a minimum of 70 volts. If the relays operate on these lower limits, make certain the thickness of the vane may be seen through the center hole of the trap bottom. Adjust by shifting the mechanism to the left or the right. Otherwise, the adjustment for this feature is limited to retensioning of the restoring springs. No appreciable amount of trouble should be experienced.

14.3 Sluggish operation may be caused by insufficient follow on the coin spring contacts. Correct any sluggishness by increasing the tension of the coin switch operating spring or by bending the contact springs, taking care that the dial shunting springs break at a minimum of .010'', and that the tension of the switch lever on the coin trigger is not increased to the point where a minimum-size dime does not trip the coin trigger. If the mating surfaces of the coin trigger and switch lever are rough, smoothing them with crocus paper will facilitate operation with the minimum-size dime.

14.4 For units which fail to collect on the proper polarity of 15 volts, collect on reverse polarity of 36 volts, fail to refund when 85 volts is applied, or fail to release from refund position with a 13-volt current, check and adjust as follows:

(1) If the collect magnet operates on the reverse polarity of 36 volts (positive to L1 for LPA 89 series and positive to L2 for LPB 89 series), the diode across the collect coil terminals is wired incorrectly or damaged. After proper wiring or replacement, recheck the relay adjustments.

(2) If the refund magnet fails to operate during the test, the trouble may be due to a faulty neon lamp or relay, both of which are located in the ringer box. During the 85-volt test, the neon lamp should flash, the relay should operate, and the neon lamp should then extinguish. The relay is supplied already adjusted, but if it fails to operate on the 85-volt test, or if it operates on the 70-volt test, either the relay is not adjusted properly or the neon lamp is faulty. During the 70-volt test, the neon lamp remains lighted, and the relay should not operate. If either of these units is replaced, recheck the mechanism for proper operation. (Replacement of the neon lamp should clear most of the trouble here.)

(3) Check for a clearance between the operating arm (the section connecting to the fork) and the spool head of the collect magnet when armature is operated fully in the refund position. Inspect the armature and coil cores for metal chips and remove them if found.

(4) Check the coin vane for binding; there should be a clearance between the vane and the hopper with play out in both directions. Correct if necessary.

(5) Check for binding at the engagement of the coin vane and operating lever. Remove any burrs and adjust the vane arm if it hits top of slot in operating lever.

(6) Check the trap for binding. Check for binding of the armature, operating arm, and spring levers. (It may help to remove one end of lever spring, when removing bind here).

(7) With everything working freely, adjust lever springs to the least tension permissible and still have a positive release from refund with 13 volts across terminals L1 and GRD for LPA 89 series and L2 and GRD for LPB 89 series.

(8) Check for collect operation on 15 volts (positive to L2 on LPA 89 series and positive to L1 on LPB 89 series), and refund operation at 85 volts. In most cases, operation should be satisfactory. If not, readjust the lever springs or the collect magnet armature restoring spring.

(9) If the refund operation is not satisfactory, loosen the locking screws in the armature and shift the armature towards

the refund pole piece. (When making this adjustment, movement is more readily seen if the armature is tilted to observe the clearance between the armature and the pole piece). Recheck (7) and (8).

15. TYPE LPA 89 UPPER HOUSING CONTINUITY TEST (Set Line Compensator at 4) FIGURE 4 OR 23

15.1 With the dial normal and the micro-switch open or closed, transfer spring No. 1 to transfer spring 3 reads approximately 425 ohms*; and transfer spring No. 4 to auxiliary transfer spring No. 1A reads approximately 20 ohms (on LPA 89-55 only).

15.2 With the dial off normal and the micro-switch open or closed, transfer spring No. 2 to transfer spring No. 3 reads approximately 0 ohms; and transfer spring No. 2 to transfer spring No. 5 reads approximately 0 ohms.

15.3 With the dial normal (impulse springs closed) and the micro-switch open, transfer spring No. 5 to transfer spring No. 6 reads approximately 0 ohms.

15.4 With the dial off normal (impulse springs open) and the micro-switch closed, transfer spring No. 5 to transfer spring No. 6 reads approximately 0 ohms.

16. TYPE LPA 89 LOWER HOUSING CONTINUITY TEST (FIGURE 4 OR 23)

16.1 With the hookswitch up and the coin trigger normal, the following continuity tests are made:

(1) Terminal L1 to BLK on 0.4-mf capacitor reads approximately 0 ohms.

(2) Terminal L1 to auxiliary transfer spring No. 1A reads approximately 510 ohms (on LPA 89-55 only).

(3) Terminal L1 to transfer spring No. 4 reads approximately 510 ohms (on LPA 89 only).

(4) Terminal L1 to ground switch assembly spring No. 4 reads approximately 0 ohms.

(5) Transfer spring No. 5 to transfer spring No. 6 reads approximately 0 ohms.

(6) Transfer spring No. 5 to Lug No. 5 on induction coil reads approximately 38 ohms.

(7) Lug No. 5 on induction coil to WHT wire on 5-mf capacitor reads approximately 0 ohms.

(8) Lug No. 5 on induction coil to T reads approximately 0 ohms. Terminal T to C reads continuity*.

(9) Terminal C to Lug No. 2 on induction coil reads approximately 60 ohms.

(10) Lug No. 2 on induction coil to R reads approximately 10 ohms.

(11) Lug No. 2 on induction coil to RED wire on 5-mf capacitor reads approximately 7 ohms.

(12) Terminal G to transfer spring No. 4 reads approximately 0 ohms.

(13) Terminal L2 to transfer spring No. 1 reads approximately 0 ohms.

(14) Transfer spring No. 2 to transfer spring No. 3 reads approximately 70 ohms.

(15) Lug No. 6 on induction coil to YEL on 0.4-mf capacitor reads approximately 100 ohms.

(16) Terminal L1 to transfer spring No. 6 with the (+) polarity of the ohmmeter connected to terminal L1 and the (-) polarity connected to transfer spring No. 6 reads less than 5 ohms.

(17) Terminal L1 to transfer spring No. 6 with (-) polarity of the ohmmeter connected to terminal L1 and (+) polarity connected to transfer spring No. 6 reads approximately 650 ohms.

16.2 With the hookswitch down and the collect relay operated, make the following continuity tests:

(1) Terminal R1 to YEL wire on 0.4-mf capacitor; approximately 0 ohms.

(2) YEL wire to BLK wire both on 0.4-mf capacitor is open-high resistance.

(3) Ground switch assembly spring No. 4 to transfer spring No. 6 reads approximately 0 ohms.

16.3 With the hookswitch up or down and the coin trigger tripped, transfer spring No. 5 to transfer spring No. 6 reads open circuit.

*Because these values are measured across the transmitter, they may vary considerably depending on the age of the telephone, the type of ohmmeter used, and the position of the transmitter.

17. TYPE LPB 89 UPPER HOUSING CONTINUITY TEST (FIGURES 5 OR 24)

17.1 With the dial normal and the micro-switch open or closed, transfer spring No. 1 to transfer spring No. 5 reads approximately 20-30 ohms,* and transfer spring No. 2 to auxiliary transfer spring No. 1A reads approximately 20 ohms (on LPB 89-55 only).

17.2 With the dial off normal and the micro-switch open or closed, transfer spring No. 3 to transfer spring No. 1 reads approximately 0 ohms; and transfer spring No. 3 to transfer spring No. 4 reads approximately 0 ohms.

17.3 With the dial normal (impulse springs closed) and the micro-switch open, transfer spring No. 5 to transfer spring No. 6 reads approximately 0 ohms.

17.4 With the dial off normal (impulse springs open) and the micro-switch closed, transfer spring No. 5 to transfer spring No. 6 reads approximately 0 ohms.

18. TYPE LPB 89 LOWER HOUSING CONTINUITY TEST (FIGURE 5 OR 24)

18.1 With hookswitch up and the trigger normal, make the following continuity tests:

(1) Terminal L1 to lug No. 18 on induction coil reads approximately 39 ohms.

(2) Terminal L1 to auxiliary transfer spring No. 1A reads approximately 510 ohms, (on LPB 89-55 only).

(3) Terminal L1 to transfer spring No. 2 reads approximately 510 ohms (on LPB 89 only).

(4) Transfer spring No. 5 to transfer spring No. 6 reads approximately 0 ohms.

(5) Terminal T to lug No. 18 on induction coil reads approximately 12 ohms.

(6) Transfer spring No. 1 to C reads approximately 0 ohms.

(7) Lug No. 14 on induction coil to C reads approximately 43 ohms.

(8) Lug No. 14 on induction coil to R reads approximately 11.5 ohms.

*Because these values are measured across the transmitter, they may vary considerably depending on the age of the telephone, the type of ohmmeter used, and the position of the transmitter.

(9) Terminal L2 to transfer spring No. 6 with (+) polarity of the ohmmeter connected to terminal L2 and (-) polarity to transfer spring No. 6 reads less than 5 ohms.

(10) Terminal L2, to transfer spring No. 6 with (-) polarity of the ohmmeter connected to terminal L2 and (+) polarity to transfer spring No. 6 reads approximately 650 ohms. Terminal T to C reads continuity.*

18.2 With the hookswitch down and the collect relay operated, terminal R1 to L1 reads approximately 0 ohms. Ground switch assembly spring No. 4 to transfer spring No. 5 reads approximately 0 ohms.

18.3 With the hookswitch up or down and the coin trigger tripped, transfer spring No. 6 reads open circuit.

19. MOUNTING THE ANTI-STUFFING DEVICE (CONVERSION KIT P-70293 AND DRILL JIG P-70294)

Conversion of a paystation to incorporate the anti-stuffing device coin-return chute requires the following parts:

1 P-70293	Conversion kit (which consists of)
1 P-11845	.. Coin-return escutcheon
1 P-11848	.. Swivel pin
1 P-11858	.. Anti-stuffing device
1 P-60617	.. Coin-refund chute
1 P-70294	Drill jig

19.1 Remove paystation upper housing, then remove lower housing from back plate. Remove mechanism base (with coin relay assembly and hopper) and refund chute in the following manner: retain all screws.

(1) Unlock cash-compartment door.

(2) Loosen 2 terminals at spring contacts and 1 terminal at rear of coil.

(3) Remove leads from coin relay assembly.

(4) Remove two 1/4-28 x 1/2" screws and three 10-32 x 1/4" screws at rear of back plate that hold lower housing.

(5) Remove 1/4-28 x 1/2" screws inside cash compartment in left bottom rear corner. Use slot at bottom of coin refund partition for easy access.

(6) Remove 1/4-28 x 1/2" screw in top right corner inside of cash compartment.

(7) Separate lower housing from back plate and lay back plate in a safe place.

(8) Remove two 8-36 x 1/4" round-head screws underneath mechanism base that hold coin refund chute.

(9) Remove three 8-36 x 3/16" round-head screws on inside top right of cash compartment that hold mechanism base to lower housing.

(10) Remove the 8-36 x 3/16" round-head screw on inside front center of cash compartment that also holds mechanism base.

(11) Place lower housing upright and remove the 8-36 x 3/16" round-head screw from left side of mechanism base.

(12) Lift off mechanism base, coin relay and coin hopper.

(13) Lift out coin return chute, prying up lip in front until it clears edge of lower part of escutcheon.

(14) Knock out 4 drive pins (on older type paystations only) holding escutcheon to lower housing and retain 2 drive pins to plug 2 top holes. Discard old escutcheon.

(15) Widen coin return escutcheon opening using a file, or preferably by milling (figure 25).

(16) Lay cash compartment on its side with the refund section facing upward.

(17) Place drill jig (P-70294) on lower housing in coin refund opening and clamp tight (figure 26).

(18) Using a #20 drill (0.161") and the jig guide, drill a hole through outside of cash compartment and inner partition to take swivel pin.

(19) Countersink outside hole to accommodate head of swivel pin.

(20) Plug 2 upper escutcheon holes with drive pins (removed in step 14).

19.2 Reassemble paystation by performing the following steps:

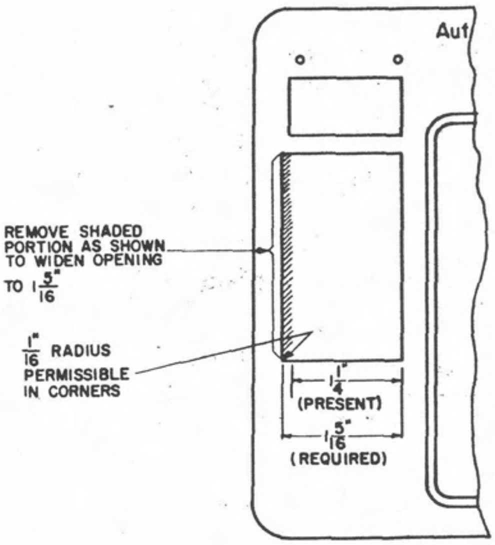


Figure 25. Widening of coin return opening in lower housing.

(1) Insert escutcheon (P-11845) into widened opening.

(2) Bend over bottom flange of escutcheon against inside surface of lower housing.

(3) Place refund chute in approximate location in lower housing with grooved pin to front at coin refund opening (figure 27).

(4) Insert end of coil spring into lip-hole of anti-stuffing device (figure 28). Close up loop of spring after this assembly.

(5) Give the anti-stuffing device one half-turn; this is necessary because anti-stuffing device is positioned upside down to make it easier to insert the coin spring.

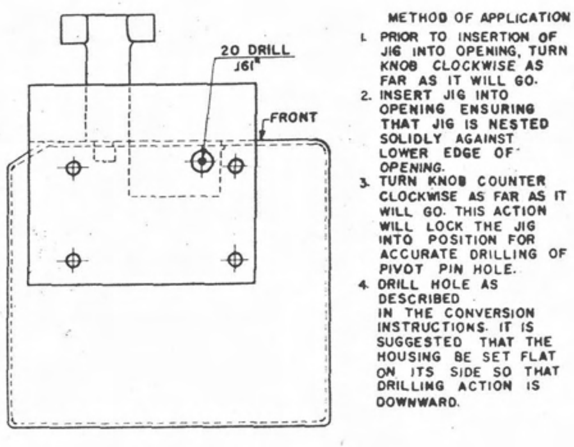


Figure 26. Drilling position.

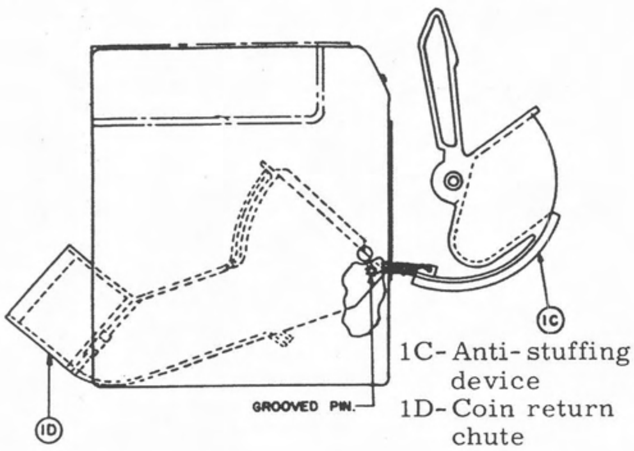


Figure 27. Insertion.

(6) Insert anti-stuffing device into coin return opening. Line up holes of anti-stuffing device, refund chute, and lower housing to facilitate insertion of swivel pin.

(7) Peen over legs of swivel pin against sides of partition.

(8) Place mechanism base, coin relay and hopper in position on top of lower housing. Hold refund chute up so coin hopper can slide inside edges of chute.

(9) Carefully lay lower housing, front down. Do not damage anti-stuffing device.

(10) Insert an 8-36 x 3/16" round-head screw in top left hole inside of cash compartment. Move mechanism base to line up threaded hole of base with hole in lower housing.

(11) Do not tighten screw at this time.

(12) Insert an 8-36 x 3/16" round-head screw in lower left hole inside of cash compartment, take up approximately 2 turns leaving this screw loose. Place lower housing on its back.

(13) Insert an 8-36 x 3/16" round-head screw at inside front center of cash compartment leaving this screw loose.

(14) Place an 8-36 x 3/16" round-head screw in remaining hole of mechanism base and tighten securely.

(15) Tighten other 3 round-head screws securely. To facilitate insertion of these screws, use a screw holding tool.

(16) Secure refund chute to mechanism base with an 8-36 x 1/4" round-head screw (figure 28). Mate lower housing to back plate with back plate lying flat on bench.

(17) Using a screw-holding tool, insert a 1/4-28 x 1/2" screw into top right corner inside cash compartment. Leave screw loose.

(18) Insert a 1/4-28 x 1/2" screw at bottom left corner inside of cash compartment. To reach screw, insert screwdriver through slot in partition. Lift paystation upright.

(19) Insert a 1/4-28 x 3/8" screw in top right corner at rear of back plate.

(20) Insert a 1/4-28 x 3/8" screw in bottom left corner at rear of back plate.

(21) Insert three 8-32 x 1/4" screws in remaining holes. Tighten screws.

(22) Install upper housing and lock.

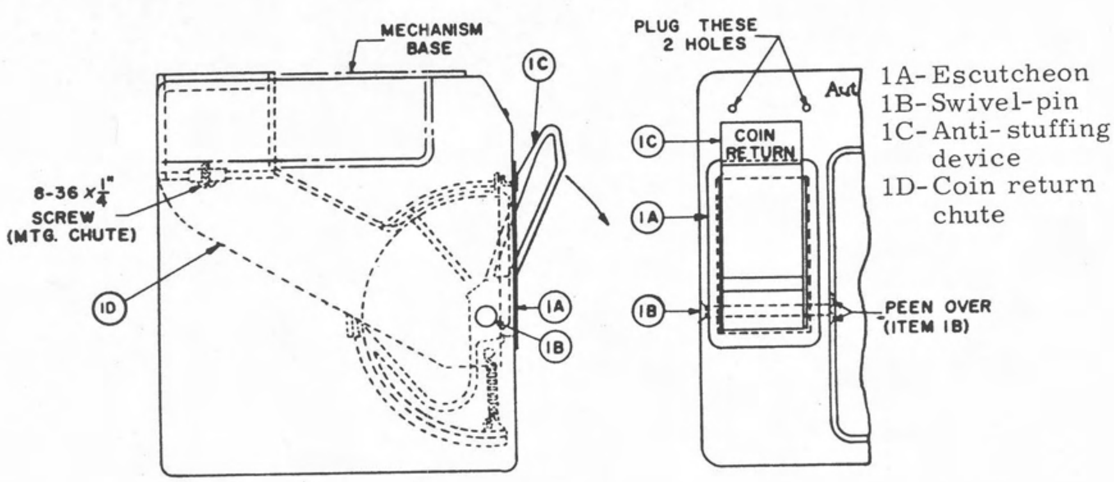


Figure 28. Completion.

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